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ABSTRACT

Previous studies have reported that disadvantaged children tend to loose the skills and abilities they had acquired in special and/or intervention programs when they are placed in education settings which do not support their needs. Since the 1970 census data tended to indicate that the pupil composition of the schools had changed, it became important to determine (1) whether the impact of the intervention components which had been successful were still intact and (2) whether they were still producing the desired results. If the composition of the schools had changed, did the current allocation decisions address the needs of the pupils and schools. A demographic analysis was made of the 1970 census data to determine the characteristics of the pupil populations in the elementary schools. A systematic review was made of the kinds of service-inputs of each of the elementary schools reviewed currently and in 1972. Through a component analysis procedure, descriptions of the summative or aggregate inputs of the respective projects formed were developed. Comparisons between the current and 1972 service-inputs were made to determine whether the kinds of services received currently differed from those received in 1972. The reading performance scores of the children in the respective elementary schools were used. The data was from the spring 1974 administration of the California Achievement Test. (Author/JM)

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PERMANENCE OF THE IMPACT OF INTERVENTION COMPONENTS OF COMPENSATORY EDUCATION PROGRAMS

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PERMANENCE OF THE IMPACT OF INTERVENTION COMPONENTS OF COMPENSATORY EDUCATION PROGRAMS

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From a study of the impcat of ESEA Title I services on urban elementary schools and their pupils in 1972, four intervention components were identified and were found to have a positive effect on pupil achievement. In subsequent years, additional studies were made of the variables which contributed to the individual success of each component.

A follow-up study was undertaken to ascertain whether the pupil service inputs of the intervention components had changed and whether the level of success of each component was the same as the observed in 1972. Detailed analyses of the observed changes were conducted to determine (1) which conditions have remained constant and (2) which are most closely related to current achievement patterns.

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PERMANANCE OF THE IMPACT OF INTERVENTION COMPONENTS OF COMPENSATORY EDUCATION PROGRAMS

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In 1972 a detailed study was made of the impact of ESEA, Title I projects on elementary schools in Philadelphia (Brown, 1972[a]). The study was undertaken to determine whether the assignment or allocation of Title I projects to the elementary schools formed systematic service-input patterns. The results of the study showed that the allocation decisions were valid. The allocation decisions followed two principles: (1) implement projects which are consistent with the needs of the pupils, (2) provide planned-variations to meet the range of pupil needs within the schools. In operations terms, the decision rule was: Provide Title I services in a manner that is consistent with the specific needs of each eligible school.

The composition of the services the schools received through the allocation procedures was analyzed from three levels of program involvement: General, Functional, and Operational (see Table 1). The first level of investigation produced program descriptors which defined each project's global or broad area of service. Three input descriptors were identified: BAS, OIA, SUP. Brief descriptions of each input descriptor follow:

1. BAS, Basic Skills development: Services to improve reading and arithmetic skills;

TABLE 1

A Description of the Levels of Service Inputs Achieved Through the Allocation of ESEA, Title I Projects

General Input Descriptors	Functional Descriptors (individual projects)	Operational Descriptors (groups of projects)
1. Basic Skills (BAS): Services for improving reading and arithmetic skills 2. Other Instructional Areas (OIA): Services in instructional areas other than BAS 3. Supportive Services (SUP): Services which support the instructional activities of the schools and/or give special assistance to the pupils	Goals, objectives, materials, methods, procedures, and/or specialized services to be provided	1. Educational/Cultural Enrichment Experiences 2. General Instructional and Supervisory Support System 3. Intensive Instructional and Supervisory Support System 4. Remediation Programs

2. OIA, Other Instructional Areas: Services in instructional areas other than the basic skills;

3. SUP, Supportive Services: Services which support the instructional activities of the schools and/or give special assistance to the pupils.

The second level of investigation consisted of defining the projects' inputs as service functions. Functional descriptors are indicators which describe the procedures, processes, and/or methods that are used to deliver a project's service(s). Functional descriptors are, in reality, the goals/objectives of the project; its materials, instructional methodology, and implementation strategy.

The third level of investigation consisted of translating the singular service-inputs of a variety of projects into a unified or operational whole. Operational descriptors are indicators which describe the comprehensive input that is associated with the cluster of projects within a given school. They are indicators which describe the aggregate or summative effect(s) of groups of projects. Through a component analysis procedure, four operational descriptors or components were identified: (1) Educational/Cultural Enrichment Experiences, (2) General Instructional & Supervisory System, (3) Intensive Instructional & Supervisory System, and (4) Remediation Programs.

Since 1972 two additional studies have been conducted to learn more about the influences of the four intervention components on school achievement, and about the interrelationships of the service-inputs of their project clusters. The purpose of the first study was to see if variations in the amounts of expenditure for the three service-inputs (viz., BAS, OIA, SUP) produced different school achievement patterns--especially

those within a given operational component (Brown, 1972[b]). The study showed that the ratio of expenditure for the service-inputs was related (1) to the need characteristics of the pupils within the schools and (2) to the content and capacity of a school's operational service. Two other key findings were:

1. The composition of a school's expenditures for the service-inputs was a better predictor of a school's ability to increase pupil achievement than was its total (aggregate) level of expenditure;

2. Each operational component had an optimal service-input mix and, in schools having the optimal mix, the pupils performed at higher levels of achievement than those in schools having a less than optimal mix. The study concluded with statements on what the optimal service-input mix should be for each operational component.

The second study sought to determine why discrepancies or misalinements occur between the needs and resources of schools having compensatory programs (Brown, 1974[b]). The study identified two major factors. One factor was found to be pupil turnover--that is, changes in a school's pupil population. It was observed that the original allocation decisions for the projects dealt with the eligible schools' populations as of 1968. And, although it was known that the schools' populations were changing, most of the materials, personnel training, and/or services used in the initial implementation of the projects could not, in a practical sense, be transferred from one school to the next. Therefore, as the years passed by, the intentions of the projects became less representative of the schools' needs.

The second factor is related to the inflexibility of compensatory funds. It was observed that once a misalinement is identified, it persists

and enlarges because funds are not available to institute the immediate and/or transitional changes required by the new service demands. That is, discretionary monies, which would allow these necessary shifts to occur while maintaining current levels of service, are not available.

Purpose of the Study

The studies of Campbell and Frey (1970) and others have reported that disadvantaged children tend to loose the skills and abilities they had acquired in special and/or intervention programs when they are placed in educational settings which do not support their needs, and since the 1970 census data tended to indicate that the pupil composition of the schools had changed, it was important to determine (1) whether the impact of the intervention components which had been successful were still intact and (2) whether they were still producing the desired results. And, that if the composition of the schools had changed, whether the current allocation decisions were addressing the needs of the pupils and schools.

Educational or Scientific Importance of Study

The question of the persistence of the effects of compensatory education programs, or public education itself, has been vigorously debated over the past decade. And, following from these considerations have been attempts at the replication of studies, situations, and/or conditions which might have produced positive results. However, these efforts have not provided the desired information (Campbell & Erlebacker, 1970; Zimiles, 1970).

One possible outcome of the study is a method for following-up on cases where one is interested in determining whether a program treatment or component is capable of producing and/or maintaining a desired outcome.

Inherent in the current study's procedures are two aspects which other follow-up studies seemed to have missed: (1) The acknowledgment that the condition observed and analyzed is equivalent to that of the previous period and (2) the determination of the summative inputs and whether they have also changed over the given interval. For if either or both of the conditions mentioned had have changed significantly over the interval studied, the follow-up study is not a replication--it is an assessment of the new condition. And, the new condition might be one whose focus is different than that of the previous period due to planned changes and/or modifications for meeting the new service demands.

METHOD

Pupil Population Served

A demographic analysis was made of the 1970 census data to determine whether the characteristics of the pupil populations in the elementary schools used in the 1972 study had changed. To describe the characteristics of the pupils being served in the 1972 study, four need categories were developed: Low, Moderate 1, Moderate 2, and High. Definitions of these need groups are given in Table 2. The population description was derived from a compilation of performance data; goals and objectives of projects/programs designed to serve disadvantaged children; teacher interviews; and findings of studies on pupils in Philadelphia and in other large urban areas. The pupil characteristics of the specific categories were derived from an intensive study of the kinds of pupils who were served by the four intervention components described previously. The analysis consisted of developing a pupil composite for each of the groups.

Comparison Procedures

A systematic review was made of the kinds of service-inputs each of the elementary schools reviewed currently and in 1972. Through a component analysis procedure, descriptions of the summative or aggregate inputs the respective projects formed were developed. Comparisons between the current and 1972 service-inputs were made to determine whether the kinds of services received currently differed from those received in 1972.

Comparisions of the distribution of achievement performance of pupils in grades 3, 4, and 5 were made to see if the achievement performance patterns in 1974 differed from those of 1972.

Data Sources

The reading performance scores of the children in the respective elementary schools were used. The data was from the Spring, 1974 administration of the California Achievement Test (CAT-70).

The annual application for ESEA, Title I funds was used as the source for identifying the level and kinds of individual projects the respective schools were receiving.

Limitations of the Study

The demographic data from the 1970 census showed that there had been shifts in Philadelphia's population; thereby, causing a number of the schools in the original study to become ineligible for Title I services. Therefore, the analyses of the study are of two types. In cases where data was available on all of the original schools, the analyses covered all schools. (This was done to give the broadest possible coverage.) However, in analyses which dealt with the comparison of service-inputs received, only those schools which were eligible in 1972 and 1974 were used.

Comparisons of pupil achievement was confined to differences in

TABLE 2

General Characteristics of Children Being Served

by Compensatory Education Programs

Pupil Need Category	Pupil Characteristics
Low	Pupils who, although performing near national expectations, lack that level of personal incentive and motivation which is required to make them perform at their full capacity or to realize their potentialities/talents in terms of their career aspirations and life goals
Moderate #1	Pupils who require repetitions of instruction in a variety of of ways and in a number of instructional modes. Such repetitions maximize their learning potential by matching their individual learning styles and through constructive reinforcements
Moderate #2	Pupils who must be taught in small groups (4 to 10 pupils). These pupils because of their low proficiency in reading and arithmetic skills cannot successfully perform independent and/or individual instructional activities (i.e., find main ideas, deduce logical or figurative inferences)
High	Pupils who have profound difficulties in learning and who require instruction on an individualized basis. Although no generalized program is meaningful, enough similarity of individual need exists to formulate groups of two or three pupils

performance distributions. That is, differences in the proportion of pupils who placed in specified achievement percentile ranges: ≤16th, 17th-49th, 50th-83rd, >83rd. Although two years had passed since the last testing and although the standardized test used in 1972 was different (viz., Iowa Tests of Basic Skills), it was assumed that reliable comparisons could be made between the distributions of the two tests because of the number of pupils comprising the sample (N > 6,000) and due to the breath of the achievement spectrum over which the majority of the pupils are to be compared.

RESULTS

Population Being Served

According to the 1970 census data, the distribution of low-income families in the city had changed significantly. Because of these changes, 17 (25%) of the elementary schools in the 1972 study were no longer eligible for ESEA, Title I services. Of the remaining 52 schools, 17 (32.7%) showed an increase in enrollment of children from low-income families; 20 (38.4%) showed a decrease; and 15 (28.9%) remained the same. By need classification, the greatest increase in enrollment of low-income children occurred in Moderate 1 Need schools (+38.4%); the greatest decrease occurred in Moderate 2 Need schools (-50.0%). These and other data are shown in Table 3.

The census data also showed that, on the average, 52% of the pupils in Moderate 1 Need schools come from low-income families; 58% in Moderate 2 Need schools; and 68% in High Need schools. Overall, from 39 to 90% of the pupils in the eligible schools come from low-income families.

TABLE 3

Summary and Analysis of the 1970 Census Data on

the Sixty-Nine Schools in the 1972 Study

Pupils From Low-Income Families	Low Need Schools[b]	Moderate Need Schools		High Need Schools	All Eligible Schools
		1	2		
1973-1974 Population[a]					
Mean	(18%)	52%	58%	68%	59%
Median	(19%)	49%	52%	70%	53%
Range	(9-37%)	39-71%	39-77%	41-90%	39-90%
Comparisons of 1971-72 and 1973-74 School Populations[c]					
Increase in Number	none	5	7	5	17
Decrease in Number	none	2	12	6	20
Same Number	none	6	5	4	15
Ineligible Number	13	2	2	none	17
Total Schools	13	15	2(	15	69

[a]Source: 1970 Census

[b]Ineligible Schools as of the 1973-1974 school year.

[c]Differences of 4% or better were considered to be meaningful changes. A four percent (4%) change means a gain or loss of at least 35 pupils; median enrollment of total schools is 883.

In addition, it was found that an average of 18% of the pupils in the newly released Title I schools were from low-income families.

To get a better picture of what happened to the schools as a result of the changes in pupil population, more refined analyses were performed. The results are shown in Table 4. The objective of these analyses was to demonstrate the range of instructional reorganization that has to occur as a result of changes in the number of low-income children a school must serve. For example, suppose a school's low-income family population increased by 24%. This would mean that the school could receive up to 212 new (to the school) pupils. And, as is shown in Table 4, the schools' administrator and staff would have to make accommodations for at least six new instructional class units. Accordingly, appropriate instructional materials and program resources would have to be secured, organized, and implemented to meet the new demand. Note that had the increase been up to 49%, one would expect as many as 654 new pupils and would have to make plans for up to 19 new instructional units. Conversely, decreases up to 24% means a reduction of up to 212 pupils and the dissolution of up to six instructional units.

In the real world, however, changes in the composition of elementary schools' populations are not this straightforward. There are changes in total school enrollment too. This dynamics of change is commonly called "pupil turnover," where the resulting enrollment is a composite of the net change. Table 5 summarizes the impact of pupil turnover in the elementary schools of the study. The table gives the mean percentage gain (increase), loss (decrease), and turnover (net change) for the total group as well as for the respective school need groups.

All eligible schools. Although the population of pupils being

TABLE 4

Relationships Between Changes in the Proportion of Low-Income Children and School Organization

Proportion of Eligible Pupils Within Schools (in percent)	Number of Eligible Pupils[a]		Number of Eligible Classes[b]	
	Minimum (n=0)	Maximum (n=883)	Minimum (n=0)	Maximum (n=25)
Up to 24%	0	212	0	6
25 to 49%	221	432	6	12
50 to 74%	441	654	13	19
75 to 100%	661	883	19	25

[a] Median enrollment of schools in study is 883.

[b] Average class size for study is 35 pupils. To determine the number of classes, one divides the Number of Eligible Pupils by 35. NOTE: School eligibility = 38.5% of total enrollment.

TABLE 5

Mean Increase, Decreases, and Net Changes in the Schools' Population of Low-Income Children

Statistic	Low Needs Schools	Moderate Need Schools		High Need Schools	All Eligible Schools
		1	2		
Mean Percentage Increased	n.a.[a]	15.6%	19.5%	30.0%	21.5%
Range of Increases	n.a.	4 to 31%	12 to 40%	11 to 55%	4 to 55%
Pupil Change Equivalents[b]	n.a.	35 to 274	106 to 353	97 to 486	35 to 486
Mean Percentage Decreased	18.0%[c]	6.5%	21.2%	25.2%	21.6%
Range of Decreased	n.a.	6 to 7%	11 to 53%	11 to 59%	6 to 59%
Pupil Change Equivalents	159	53 to 62	97 to 468	97 to 521	53 to 521
Net Change (Turnover)					
Difference in Percentages[d]	n.a.	+9.1%	-1.7%	+4.8%	-0.1%
Range of Differences:					
As Pupil Equivalents	-159[c]	-18 to +212	+9 to -115	0 to -35	-18 to -35
As Classroom Units[e]	-4.5	-0.5 to +6.1	+0.3 to -3.4	0 to -1.0	-0.5 to -1.0

[a]n.a. = Not applicable

[b]Median enrollment of schools is 883. Pupil Equivalent=883 times percentage.

[c]Change due to ineligibility of schools. Consequently, eligible pupils in these schools do not receive Title I intervention services.

[d]Difference in Percentages=Mean Percentage Increase minus Mean Percentage Descrese. Range of Differences computed in a similar manner.

[e]Average classroom size is 35 pupils. Classroom Unit=Pupil Equivalent divided by 35.

served by Title I projects have changed at different rates, in the main, the amount of gains and losses by the schools balanced over the three school need groups. Arithmetically, one expects that the number of pupils leaving one group of schools (loss) would equal the number entering other schools (gain); however, it is interesting to note that the median turnover in the population of eligible schools studied was 35 pupils or one instruction unit. Nevertheless, by school need classification, the population of low-income children entering Moderate 1 and High Need schools is increasing; the number in Moderate 2 Need schools, the largest proportion of schools, is decreasing.

Low Need schools. Although Low Need schools are no longer eligible to receive Title I services, in a typical school of 883 pupils, one would find an average of 159 eligible children or enough pupils to form at least 4.5 classes of 35 pupils each.

Moderate 1 Need schools. Although changes had occurred within these schools, the schools showed a net median gain of 80 pupils (+9.1%). The range of change differences or turnover among the schools was from a loss of 18 pupils (-2.4%) to an increase of 212 pupils (+24.1%). Translated into classroom units of 35 pupils each, a typical school could loose one-half a class or gain up to 6 new classes of low-income children.

Moderate 2 Need schools. Although turnovers occurred within these schools, the schools showed a net median loss of 15 pupils (-1.7%). The range of differences among the schools was from a gain of nine pupils (+1.0%) to a loss of 115 pupils (-13.2%). Translated into classroom units of 35 pupils each, a typical school would gain one-third of a class or loose up to 3.5 classes.

High Need schools. Although turnovers occurred within these schools, the schools showed a net median gain of 42 pupils (+4.8%). The range of

differences among the schools was from that of a normal enrollment to a loss of 35 pupils (-4.0%). Translated into classroom units of 35 pupils each, a typical school would either maintain its current number of classes or loose up to one class.

To cross-validate the previous results and to ascertain whether the change data was a function of changes in total school enrollments, comparisons were made of FY 1971-1972 and FY 1973-1974 total school enrollments. The results of these comparisons are shown in Table 6. In brief, all eligible schools' total enrollments decreased by 54 pupils or 1.5 classes-- that is, reduced by 6.0%. By school need classification, the reductions (as percentages) were: Low Need = 3.8%; Moderate 1 = 5.9%; Moderate 2 = 3.2%; High Need = 10.7%.

When the results of the total school enrollments are combined with the changes in low-income family data, a generalized picture of the turnover patterns of the schools emerge:

1. All eligible schools had experienced a decrease in total enrollment;

2. Moderate 1 Need schools, having a reduction in total enrollments and moderate increases in low-income families, had experienced a major, absolute increase in low-income (eligible) children;

3. Moderate 2 Need schools had experienced reductions in both eligible and ineligible children;

4. High Need schools had expereinced a reduction in ineligible children and a moderate increase in eligible children.

Component or Aggregate Services Provided

As was indicated earlier, since the study of 1972, two related studies were conducted. These studies made it possible to cross-reference the requirements of the children in the four need groups with the comprehen-

TABLE 6

Mean and Range of Total School Enrollments in

FY 1971-1972 and FY 1973-1974

Need Categories	School Year 1971-1972	1973-1974
Low Need Schools		
Number	8	8
Mean	758	729
Range	465-1126	308-1384
Moderate 1 Schools		
Number	10	10
Mean	834	785
Range	558-1546	460-1376
Moderate 2 Schools		
Number	22	
Mean	877	849
Range	424-1417	317-1500
High Need Schools		
Number	15	15
Mean	979	875
Range	465-1396	306-1183
All Eligible Schools		
Number	55	55
Mean	881	827
Range	424-1546	308-1500

sive services of the four intervention components described in 1972. Essentially, the matrix presented in Table 7 shows the relationships between pupil need requirements and program component expenditures. The knowledge of these relationships is essential for understanding and interpreting the results of the following investigations.

It is also helpful to review the findings of the studies which followed the 1972 study. They are: (1) The decisions for the allocation of Title I projects in 1972 created four intervention components which were having a significant impact on pupil achievement; (2) variations in the delivery and implementation of an intervention component depended upon the level of project service a school receives; (3) each intervention component has an optimal mix of project service-inputs; and (4) the optimal mix of each intervention component had been predicted.

In the present study, care was taken in the collection, documentation, and analysis of service-input data. Details of the comparisons of service-inputs provided in FYs 1971-1972 and 1973-1974 follow. Four kinds of comparisons will be presented: Those between (1) the number and kinds of projects provided; (2) the level of service provided to the schools (service saturation); (3) the proportion of categorical expenditures (service specification); and (4) the projected and actual expenditure patterns of the intervention components.

Number and Kinds of Projects Provided

A content analysis procedure was used to identify the kinds of project services that were available through the 1973-1974 Title I program. Although a stand-still budget was in operation, a process of service refinement occurred which resulted in the elimination of eight projects offered in FY 1971-1972. Six were of the OIA type; two of the SUP type. The projects

TABLE 7

Relationships Between Pupil Requirements and Programmatic Expenditures of the Intervention Components

Systematic Service Requirements of Target Population Children	Programmatic Characteristics of the Intervention Components
• Low Need Experiences which expand their involvement and knowledge of world cultures, cultural affairs/events, and opportunities for career exploration	• Educational/Cultural Enrichment Experiences Expenditures directed toward the improvement of the pupil's attitudes toward himself, his and others cultures, and his career/life goals
• Moderate 1 Need An enriched classroom environment where alternative or innovative teaching-learning conditions are provided in whole class and small groups situations	• General Instructional and Supervisory Systems Expenditures directed toward the improvement of the pupil's instructional experiences
• Moderate 2 Need Well-defined and highly structured instructions in reading and arithmetic, usually in small instructional units (4 to 10 pupils)	• Intensive Instructional and Supervisory Systems Expenditures directed toward the intensification of instruction in the basic skills area
• High Need Continuous corrective instruction in a specialized setting on an individual or homogeneous group (2 to 4 pupils) basis by instructional specialists	• Remedial Programs Expenditures directed toward the establishment of permanent basic skills centers and systems for continuous exposure to individualized instruction

were either those whose services could be generalized to serve all pupils or those which were not producing the desired levels of service. Therefore, the services of some of the dropped projects were continued by a turn-key action.

Six of the projects serving the selected schools in the 1972 study were retained. One provided BAS services; two provided SUP services; and three provided OIA services. The BAS project provided individualized reading services on a continuous basis (viz., Reading Skills Centers). The OIA projects provides alternative instructional methods and/or opportunities. The SUP projects provided a wide range of proved supports for improving classroom instruction and/or improving the information available on the goals, purposes, and intentions of a school's instructional program.

Thirteen new projects were providing services to the schools in the 1972 study. Four were BAS projects; seven were OIA projects; two were SUP projects. Some of the new projects were quite specific and served only a small proportion of the schools (e.g., Bilingual Education, Itinerate Hearing); whereas others were comprehensive services provided to the schools in a systematic manner (e.g., Comprehensive Reading and Comprehensive Mathematics Projects). The BAS projects were directed toward the provision of increased inputs for the improvement of reading and mathematics skills. The OIA projects, in the main, were designed (1) to enrich all aspects of instruction in the classrooms and (2) to broaden the cultural and societal experiences/knowledge of the pupils. The SUP projects were aimed at supporting the instructional programs of the schools (1) by improving the delivery of classroom services and (2) by expanding the availability of learning facilities and/or resources.

Table 8 presents comparisons between the number and kinds of projects serving eligible schools in FYs 1971-1972 and 1973-1974. The data was prepared to show not only the total number of projects provided in the two years, but also the kind of service-input each project provided. The table also illustrates the kinds of service the FY 1973-1974 ineligible schools received in FY 1971-1972.

All eligible schools. There were two major changes over FYs 1971-1972 and 1973-1974. The first change was to increase, by 4 project, the number of projects a typical school would receive. Two were of the BAS type; two of the SUP type. The second change was a provision for having all eligible schools receive a comprehensive reading and mathematics project. The systematic addition of these projects created a leveling-off of services to the eligible schools and, thereby, affected the nature of the intervention components of the schools.

The eligible 1973-1974 schools retained two of the four intervention components described in the 1972 study. They were: Intensive Instructional & Supervisory Systems and Remedial Programs. Details of the service-inputs provided to the schools in these components follow.

Moderate 1 Need schools. This group of schools received the Intensive Instructional & Supervisory System component. The schools received an average of two additional projects. The new BAS projects provided comprehensive services for the improvement of reading and arithmetic skills. There was also a reduction in the number of SUP projects and a corresponding increase in OIA projects. The OIA project represented services to improve the cultural and educational experiences of the pupils.

Moderate 2 Need schools. This group of schools received the

TABLE 8

Categorical Analysis of the Content of the Services Provided to Title I Elementary Schools During Fiscal Years 1971-1972 and 1973-1974 (as median number of service projects provided)

Pupil Need Category	Fiscal Year	Characteristics of School Input Services				
		BAS Projects				
		Direct Services	Systematic Resources	OIA Projects	SUP Projects	Total All Services
Low	1971-1972	--	--	1	1	2
	1973-1974[a]	--	--	--	--	--
Moderate						
#1	1971-1972	--	--	2	2	4
	1973-1974	--	2	3	1	6
#2	1971-1972	1	--	3	2	6
	1973-1974	1	2	4	2	9
High	1971-1972	1	--	4	2	7
	1973-1974	1	2	4	2	9
All Categories	1971-1972	1	--	2	2	5
	1973-1974	1	2	4	2	9

LEGEND: BAS=Basic Skills, OIA=Instructional other than BAS, SUP=Supportive Services. Direct=direct pupil services (e.g., classroom aide), Systematic=generalized resources that fulfill the differing needs of the schools (e.g., Mathematic Resource Teacher).

[a]Schools no longer eligible for services.

Intensive Instructional & Supervisory component. The schools received an average of three additional projects. Two of the projects were of the BAS type; one of the OIA type. The new BAS projects provided comprehensive services for the improvement of reading and mathematics skills. The new OIA project provided services to improve the cultural and educational experiences of the pupils.

High Need schools. This group of schools received the Remediation component. The schools received an average of two additional projects. Both projects were of the BAS type which provide comprehensive services for the improvement of reading and mathematics skills.

Level of Service Provided

Another important aspect of the 1972 study was the determination of the degree to which the schools received the approved projects. The consideration of how many schools within the intervention components receive average (or better) inputs is termed "service saturation." This concept is most important in the determination of the optimal mix of projects, as well as in the specification of "service maintenance levels."

Comparisons of service saturation data of FYs 1971-1972 and 1973-1974 indicated that a significant increase in the level of service to eligible schools had occurred. The data showed that in FY 1973-1974, a determined effort was made to insure that all eligible schools had the same (equivalent amounts) level of project service. Table 9 summarizes these data.

All eligible schools. There was a systematic increase in the level of service provided to the schools. The greatest increase was in the provisions for services in the development of basic skills. All schools received the services of two more BAS projects. With the exception of one

TABLE 9

Levels of Project Services Provided to the Schools

in FY 1971-1972 and FY 1973-1974

Pupil Need Category	Fiscal Year	BAS Projects		OIA Projects	SUP Projects
		Direct Services	Systematic Resources		
Low	1971-1972	--	--	90%	50%
	1973-1974[b]	--	--	--	--
Moderate					
#1	1971-1972	--	--	64%	73%
	1973-1974	20%	100%	80%	100%
#2	1971-1972	72%	--	84%	80%
	1973-1974	72%	100%	95%	80%
High	1971-1972	100%	--	67%	100%
	1973-1974	100%	100%	87%	43%

LEGEND: BAS=Basic Skills--services to improve reading and arithmetic skills. Direct=direct pupil services (e.g., classroom aide), Systematic= generalized resources that fulfill the differing needs of the schools (e.g., Mathematic Resource Teacher); OIA=Other Instructional Areas--Services in instructional areas other than BAS; SUP=Supportive Services--services which support the instructional activities of the schools (e.g., Instructional Supervisors) and/or give special assistance to the pupils (e.g., library aides).

[a]Services provided through general or operational funds not included.

[b]Schools no longer elibible for services.

case (viz., the SUP projects of High Need schools), OIA and SUP services were increased by an average of 18%. These actions tended to insure that all eligible schools received the same level of service-inputs. It should be noted, however, that the method for implementing these services varies from project to project, and that the successful integration of the new projects into the mainstream of on-going school activities depends upon the type and intention of the respective services.

Low Need schools. As is shown in the table, in FY 1971-1972 90% of the Low Need schools received the service of an OIA project; 50% received the services of a SUP project. However, in FY 1973-1974 none of these schools received the services of Title I projects.

Moderate 1 Need schools. There was a systematic increase in the number of schools which received the services of Title I projects. While no schools received BAS projects in FY 1971-1972, 20% of them received direct BAS type services and 100% of them received BAS systematic resources type services in FY 1973-1974. There was a 14% increase in the number of schools receiving OIA project services and a 27% increase in the number receiving SUP project services. These increases in service have tended to equalize the level of service the schools in this intervention component receives.

Moderate 2 Need schools. There was a consistent increase in the number of schools which received the services of Title I projects. There was a 100% increase in BAS systematic resources and a 11% increase in OIA project services. These increases, particularity in BAS services, provide more than three-fourths of the schools with the viable ingredients of an effective Intensive Instructional & Supervisory System.

High Need schools. There was a 100% increase in the number of schools receiving BAS systematic resources and a 20% increase in the num-

ber receiving OIA project services. There was a 57% decrease in the number receiving SUP project services; however, a great proportion of this loss was covered through the supportive actions of the turn-key operations. With the 100% of direct BAS and BAS systematic resources in these schools, it appears as if the schools in this group have those resources that are required to build balanced remedial programs.

Categorical Expenditures

Through the proration procedure described in the 1972 study, estimates of the projects' median service costs were determined. From these estimates, a total service-delivery cost index was derived for the average eligible school in each of the intervention components (see Table 10). To obtain a total service-delivery cost, one multiplies the number of projects a school receives by the median service cost for the respective project, and then sums across all service entries. As is shown in the table, the median service cost for providing the services of a BAS project is $18,000. Since the Moderate 1 Need schools receive two such projects, the service-delivery cost for the BAS projects is $36,000 ($18,000 x 2 = $36,000). These sites also receive the services of three OIA projects ($4,900 each) and one SUP project ($7,900 each). Therefore, the total service-delivery cost to the schools, in this case, is $58,600 ($36,000 + $14,700 + $7,900 = $58,600).

To determine the percentage of service expenditure in terms of the three service-input descriptors, one divides the total school service-delivery cost into the expenditures for each of the service-inputs. In the example used, the percentage of service expenditures are: BAS = 61.5% ($36,00 ÷ $58,600); OIA = 25.0% ($14,700 ÷ $58,600); SUP = 13.5% ($7,900 ÷ $58,600). From these figures we find that 61.5% of the funds of Moderate 1 Need schools were spent for basic skills services; 25.0% for instructional

services in areas other than the basic skills; and 13.5% for instructional support services. The same procedures were used to obtain the data in Table 10.

All eligible schools. On the average, $89,400 worth of Title I services were provided/delivered to the eligible schools. A little more than sixty percent (60.5%) was in the form of basic skills development; 21.9% for instructional services in areas other than the basic skills; and 17.6% for instructional support services.

School need characteristics. Only slight variations occurred in and across the percentage of expenditures for service-inputs from one school need group to the next. Neither did they vary appreciably from the average school expendiutres.

Projected Versus Actual Expenditure Patterns

In a previous study (Brown, 1972[b]) optimal service-input mixes, as percentages of service expenditure, were derived for each of the school need groups. These projections were estimates of the proportions of service-input expenditures that are required to produce optimal learning conditions within the schools of each intervention components and, consequently, the production of higher rates of pupil and school achievement. To this end comparisons were made between these projected expenditure patterns and those achieved through the FY 1973-1974 allocation decisions.

All eligible schools. In total nine comparisons were made (3) service-input categories x 3 school need groups). A tolerance of ten percent (10%) was chosen. This tolerance level is based upon the median total school expenditure in 1972 ($33,800). A tolerance of 10% represents a range of ± $3,380, which is less than the median expenditure for a project's service in either FY 1971-1972 or FY 1973-1974. Therefore, a difference greater

TABLE 10

Median Service-Delivery Costs of Project Service-Inputs

Pupil Need Category	Statistic	Median Per Service Project Cost				
		BAS ($18,000)				
		Direct Resources	Systematic Resources	OIA ($4,900)	SUP ($7,900)	Total Cost of School Service[a]
Moderate #1 (Schools=9)	No. Projects	0	2	3	1	--
	Cost	--	$36,000	$14,700	$7,900	$58,600
	%-tage of Expenditure	--	61.5%	25.0%	13.5%	--
Moderate #2 (Schools=20)	No. Projects	1	2	4	2	--
	Cost	$18,000	$36,000	$19,600	$15,800	$89,400
	%-tage of Expenditure	20.2%	40.3%	21.9%	17.6%	
High (Schools=15)	No. Projects	1	2	4	2	--
	Cost	$18,000	$36,000	$19,600	$15,800	$89,400
	%-tage of Expenditure	20.2%	40.3%	21.9%	17.6%	--
All Categories (Schools=44)	No. Projects	1	2	4	2	--
	Cost	$18,000	$36,000	$19,600	$15,800	$89,400
	%-tage of Expenditure	20.2%	40.3%	21.9%	17.6%	--

Source: 1971-1972 base rate. See Brown, E. K., 1972, page 23

Note: Low need schools, being ineligible, are not included.

[a]Does not include services provided through general operating funds.

than 10% means the addition or loss of a service-input to the schools. And, such an addition or loss is significant.

As is shown in Figure 1, seven of the nine pairs of comparisons are within the tolerance range (shown by the asterisks). There was one over-estimation (shown by the plus sign) and one underestimation (shown by the minus sign). These two errors in projection were service expenditures for Moderate 1 Need schools. In either case the errors worked in the favor of the pupils and schools. The pupils and schools are receiving a higher level of service for the improvement of the basic skills than was projected--the underestimation. They are receiving a lower level of supportive services from Title I expenditures than projected (the overestimation). However, in the latter case, a proportion of these kinds of service could be pick-up as part of the distributive services a school receives.

The particulars of the comparisons are given in Table 11. Of course, no comparisons could be made for the Low Need schools, since they were no longer eligible for Title I services. However, with an average of 18% of their pupils being from low-income families, these ineligible schools have a definite need for the additional level of service expenditure shown in the table. Details for the eligible schools follow.

Moderate 1 Need schools. The projected and observed expenditure patterns agreed in only one of the three cases. The projected and observed proportions to be spent for OIA services were identical--25%. A higher proportion of the funds were realized for BAS services than projected; up by 36%. A lower proportion of the funds were spent for supportive services; down by 36%. It appeared as if the expenditures for the service-inputs had been shifted from those of a supportive nature to those related to the improvement of the basic skills.

Projected Expenditures: FY 1971-1972		Actual Expenditures: FY 1973-1974 — Moderate 1 Need Schools INPUT BAS	OIA	SUP	Moderate 2 Need Schools INPUT BAS	OIA	SUP	High Need Schools INPUT BAS	OIA	SUP
Moderate 1 Need Schools	INPUT BAS	-								
	INPUT OIA		*							
	INPUT SUP			+						
Moderate 2 Need Schools	INPUT BAS				*					
	INPUT OIA					*				
	INPUT SUP						*			
High Need Schools	INPUT BAS							*		
	INPUT OIA								*	
	INPUT SUP									*

Legend: Minus (-) means an underestimation; plus (+) means an overestimation; askerisk (*) means equal estimates.

[a]Equal estimates. Tolerance is greater than or equal to $\pm$ 10%. Median total school expenditure in FY 1971-1972 was $33,800. Ten percent or $3,380 is less than the amount of money needed to add or subtract the services of a project in FY 1973-1974 ($4,700). Therefore, differences which exceed the tolerance are significant.

Figure 1. Comparisons of the projected and actual (observed) service-input expenditures (as percentages) for Moderate 1, Moderate 2, and High Need elementary schools in Philadelphia.

TABLE 11

Comparisons Between the Projected and Observed Proportion of Categorical Expenditures for the Services Provided to Low, Moderate, and High Need Pupils

Pupil Need Category	Service Expenditure	Proportion of Expenditure		
		BAS Projects	OIA Projects	SUP Projects
Low	Projected[a]	10%	45%	45%
	Observed[b]	--[c]	--	--
Moderate				
#1	Projected	26%	25%	49%
	Observed	62%	25%	13%
#2	Projected	52%	20%	28%
	Observed	60%	22%	18%
High	Projected	60%	20%	20%
	Observed	60%	22%	18%

[a]Projected equals level of categorical service estimated from data of previous study in 1972.

[b]Observed equals prorated levels, derived through the process shown in Table 10 for FY 1973-1974.

[c]Schools no longer eligible for service.

Moderate 2 Need schools. The projected and observed expenditure patterns were very close. Proportions to be spent for the basic skills differed by 8%; for OIA services by 2%; for SUP services by 10%. Again there was a decrease in expenditures for supportive services and an increase in expenditures for the basic skills.

High Need schools. The projected and observed expenditure patterns were practically the same. There was a difference of 2% in the proportions spent for OIA and SUP services.

In summary, the patterns of expenditure for school service-inputs in FY 1973-1974 closely paralleled those suggested in the 1972b study. This finding suggests that the patterns of expenditure for school services are consistent with the intentions and/or directions of the existing intervention components.

Pupil Achievement

To determine the impact of the intervention component services on pupil achievement, comparisons were made between the achievement outcomes of the spring 1972 and 1974 test administrations. Pupil achievement was described in two ways: Grade Performance Distributions and Expected Grade Performance. Grade performance distribution is a way of showing how the pupils placed according to specified achievement percentile ranges. Four achievement performance ranges were used: at/or above the 16th National percentile, between the 17th and 49th National percentile, between the 50th and 83rd National percentiles, and above the 83rd National percentile. Expected grade performance is a way of identifying how many pupils are at the expected level of achievement according to the national standard. The dividing point is the 50th National percentile. Therefore, two achievement groups are formed: Those who perform below

grade expectation; those who perform at/above grade expectation.

By presenting pupil and school performance data in these ways, one is able (1) to determine what the distribution of performance is across the group tested and (2) to identify that (those) pupils, if any, within the performance distribution who have been effected by the services of the intervention component(s).

Grade performance distributions. Table 12 shows the results of the comparisons. Recognizing that the 1971-1972 and 1973-1974 distributions are from different standardized tests, the trends suggest that the services of the intervention components have markedly affected the achievement of pupils who placed in the 16th percentile range, and slightly effected those in the 17th to 49 and 50th to 83rd percentile ranges. The 1973-1974 distributions suggest that there were about 21% fewer 3rd-, 4th-, and 5th-grade pupils who placed in the 16th percentile than in 1971-1972; about 9% more who placed in the 17th to 49th percentile range; and about 9% more who placed in the 50th to 83rd percentile range. The greatest range of change seemed to have occurred at grade 4, followed by grade 5 and grade 3 respectfully.

Expected grade performance. As is shown in Table 12, when the 50th percentile is used as the performance criterion, there was an increase of about 12% in the number of pupils who were performing at or above grade level. Although at least 70% of the pupils were still performing below grade expectation, the data suggests the number in this group is shrinking (down from 80% in 1972).

CONCLUSIONS

In the study a distinction has been made between the needs of the pupils and schools, and the characteristics of the services provided through the intervention components. Since the identification of the intervention components in 1972, additional studies were conducted (1) to determine the

TABLE 12

Grade Performance Distributions and Expected Grade Performance of Third-, Fourth-, and Fifth-Grade Pupils

Grade	School Year	NATIONAL PERCENTILE RANGE ≤16	17-49	50-83	>83
Expressed As Grade Performance Distributions					
3	1973-1974	28	43	23	6
	1971-1972	44	36	14	6
4	1973-1974	28	38	24	10
	1971-1972	52	28	17	3
5	1973-1974	32	39	24	5
	1971-1972	55	28	11	6

		Percent of Pupils Below 50th Percentile	Percent of Pupils At or Above 50th Percentile
Expressed As Expected Grade Performance			
3	1973-1974	71%	29%
	1971-1972	80%	20%
4	1973-1974	66%	34%
	1971-1972	80%	20%
5	1973-1974	71%	29%
	1971-1972	83%	17%

achievement characteristics of the pupils; (2) to identify the instructional mode, organization, and strategies that might best serve the pupils; and (3) to ascertain those learning prerequisite variable(s) that would best describe the desired psychoeducational effects. With these data, analyses were conducted to determine the generalized need classification of the pupils served by each intervention component. Four such classifications were derived: Low, Moderate 1, Moderate 2, and High. Throughout the study, it was assumed that the aggregate services of the intervention components were inputs for meeting the needs of the children in the respective schools (Bloom, 1971).

Two of the four intervention components identified in 1972 are still serving elementary school children in Philadelphia. The two components are: Intensive Instructional & Supervisory Systems (IISS) and Remediation Programs (RP). The data of the study indicate that the reduction in number occurred for two reasons: shifts in the target pupil population, and increases in school service levels.

The Educational/Cultural Enrichment Experiences (ECEE) component was not in use because the Low-Need schools, averaging 18% low-income families, were no longer eligible for Title I services. Practically all (95%) of the schools served by the other intervention components were eligible. By school need group the changes in low-income enrollments were: an average increase of 80 pupils (+9.1%) in schools served by the GISS component; an average decrease of 15 pupils (-1.7%) in schools served by the IISS component; and an average increase of 42 pupils (+4.8%) in the schools served by the RP component. Accompanying these changes in low-income children enrollment was a general decline in total school enrollments: Low need schools = 3.8%; Moderate 1 schools = 5.9%; Moderate 2 schools = 3.2%; High need = 10.7%.

The net change or turnover in pupil populations resulted in (1) Low Need schools being eliminated from Title I services, Moderate 1 Need schools having a major increase in low-income children, (3) Moderate 2 Need schools having a modest decrease in low-income children, and (4) High Need schools having a moderate increase in low-income children.

The other component, GISS, was not dissolved, it was transformed from a general service component into an intensive service component. Eligible schools within this intervention component differed from their 1972 status in two major ways. First, the schools received the services of two more projects. The new projects were designed to deliver systematic services for the improvement of reading and mathematics skills. Second, all eligible schools received a higher level of service (service saturation) than they had in 1971-1972. These two changes caused the characteristics of the services to the schools to approach those offered by the intensive service component (IISS). Therefore, the GISS component was phased into the operations pattern of the IISS component.

The FY 1973-1974 expenditures for services within the two sustaining intervention components followed a consistent pattern: 60.5% for services to improve the basic skills; 21.9% for services to improve the instructional alternatives and/or approaches to classroom instruction; and 17.6% for supportive services and resources. These expenditure patterns closely matched the recommendations for optimal service mixes. The actual FY 1973-1974 expenditures were within 10% of the projection procedure developed in 1972b. If the relationship between service expenditure and pupil achievement are correct, the expenditure patterns of FY 1973-1974 were providing that level and variety of service which is required to construct effective learning environments for Moderate 2 and High Need pupils.

The 1973-1974 achievement data on pupils in grades 3, 4, and 5 indicated that the services being provided through the two intervention components had its greatest impact on pupils who placed at or below the 16th National percentile. Although different tests were used to obtain the performance distributions, comparisons showed that in 1973-1974, there were 21% fewer pupils in this performance range. There was a corresponding increase in the percent who scored above the 16th National percentile: +9% in the 19th-49th and 50th-83rd percentile ranges; and +3% in the above the 83rd percentage range.

The data of the study indicate that two of the original intervention components persisted. They were the two which dealt with provisions for intensive and remedial instruction in the basic skills. The increased expenditures for basic skills services seemed to have a significant effect on the ability of the schools to improve the reading performance of the pupils who were performing at or below the 16th National percentile.

The findings of the study suggests that the allocation of project services to elementary schools have a defined effect on a school's ability to deliver an effective instructional program. It would seem that the combination or mixture of projects is more crucial than one would expect and that the measurement of the outcomes of the various mixtures is a more important consideration than that of an individual project.

IMPLICATIONS

As a result of the decisions to eliminate the Educational/Cultural Enrichment Experiences (ECEE) and the General Instructional & Supervisory System (GISS) components, at least 29,917 (35.3%) of the FY 1971-1972 eligible elementary school children had their educational experiences interrupted in FY 1973-1974 (see Table 13). And since, the number of

TABLE 13

Impact of Change Decisions on the Disposition of Title I Services

to Eligible Elementary Schools

(base = FY 1971-1972)

Need Characteristic	Loss of Services[a]		Change of Service Patterns[b]		Turnover		All Cases	
	Pupils	Teachers or Classes	Pupils	Teachers or Classes	Pupils	Teachers or Classes	Pupils	Teachers or Classes
Low	11,933	331	--	--	--	--	11,933	331
Moderate 1	--	--	16,126	461	+1,467	+42	17,593	503
Moderate 2	--	--	--	--	-613	-18	-613	-18
High	--	--	--	--	+1,004	+29	+1,004	+29
Totals	11,933	331	16,126	461	1,858	53	29,917	845

Note: All data corrected for decreases in total school enrollment.

[a]Pupils in schools no longer eligible for Title I services.
[b]Schools whose level of projects and services have caused them to receive a different pattern of intervention component service.

intervention components have been reduced from four to two, the amount of diversification of intervention offerings for the eligible children has been reduced. It would appear that this reduction is a return to the philosophy of "give everyone the same" instead of the encouragement of "identify and implement instructional/learning conditions which meet the varying needs of the children."

The reduction in the number of intervention component options seems to be contrary to the goals or intentions of compensatory education; and to run counter to the recommendations of others who have studied the policies (Cohen, 1968; Gordon, 1970; Wholey, 1970), needs (Passow, 1967; Deutsch, Katz, and Jensen, 1968; Campbell, 1970; Riles, 1970; Wilderson, 1970; Bloom, 1971), and the allocation procedure/process (Barro, 1970; Block, 1971; Macleod, 1971; Bissell, 1972; Brown, 1973) of these programs. Reductions or limitations of services in well patterned intervention plans tend: 1) to destroy those prescribed learning conditions which have been established within a school district; 2) to increase the probability that the benefits received by the excluded children will be lost or eroded away; and 3) to delay the impact of compensatory education funds by the necessity to create and implement new sets of prescribed learning conditions (Brown, 1974a).

For Children in the ECEE Component

Of the 29,917 pupils affected by the change decisions, 39.9 percent (11,575) were those in the Low Need group. These are children who are attaining the highest rate of achievement--8.5 months per school year. Through the services of the ECEE component, these children are beginning to perform/achieve at their full capacity because they are developing

higher levels of personal incentive and self-worth. The 331 teachers of these children are more successful because they have/are learning how to use cultural and social experiences, affective education, and career education inputs as effective motivation tools. If the postulates about achievement regression are true, then there is a strong chance that these children could return to their past level of achievement--six months per school year.

For Children in the GISS Component

A change in service pattern (from GISS to IISS) tends to disrupt the continuity of a school's instructional program and, consequently, the learning style of their pupils. The data in Table 13 shows that at least 53.8 percent (16,126) of the pupils or 461 classes have experienced a change in their instructional program. Their 461 teachers, accustomed to receiving the services of the GISS component, have had to deal with two concurrent situations: 1) modifying their current or regular instructional program to include the additional services and/or resources, and 2) learning, organizing, and/or familiarizing themselves with the content and structure of the additonal services and/or resources. Having to conform to the aforementioned adjustments while carrying-out previous plans, undoubtedly, effects the quality and effectiveness of their teaching.

Impact on Turnovers

The problems created by pupil turnover are similar to those of changes in service patterns. The 6.3 percent (1,858) of turnover observed over the 52 schools represents the potential restructuring of 53 classes, or about one per school. Although a constant problem to the schools, turnovers of the level mentioned are anticipated by most schools and can be absorbed within the schools without much trouble.

Advantages of the Changes

The changes would tend to help those schools, teachers, and pupils in the Intensive Instructional & Supervisory System (IISS) and Remediation Program (RP) components. That is, the equalization of services, resources, and materials considerably reduced the service variation among the schools; thereby, providing all the teachers with that breath of materials and resources they required to develop individualized plans for their Moderate- and High-Need pupils.

Recommendation

Although change is essential for the establishment of effective educational programs for disadvantaged children, it would appear that major changes, such as those discussed, do not have the potential for improving the learning opportunity of the children. Instead of massive, categorical changes which precipitate the elimination or reduction of intervention components of a school district, it would appear that one should follow one of the alternative recommendations of the 1972 study:

Alternative #1. Redistribute the levels of PSC (service-input) expenditures within each model (intervention component). This procedure assumes that the current implementation models have programmatic inputs which are consistent with the needs of each pupil population, but that the level of funds allocated within the models (components) for the respective PSCs (service-inputs) are disporportionate for the required services (Brown, 1972a, p.78).

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